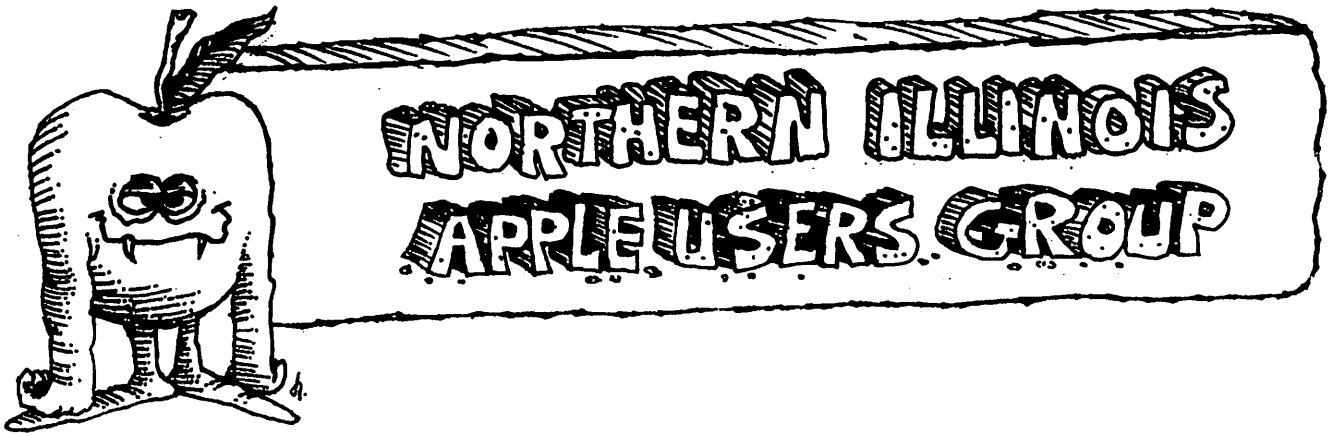

VOL.2, NO.8

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THE HARVEST

FEATURE ARTICLE

MICROSOFT BASIC COMPILER

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In a previous review of Apple Pascal, I considered ease of program development, speed of program execution, standardness and availability of published programs and ability to interface to peripherals and machine language as criteria. On this basis, I rejected the Apple USCD-Pascal system (and with it their Fortran). Applesoft Basic is superior in cases where ease of program development and interfacing are prime considerations and Microsoft Fortran (using the Z80 card) is superior when access to standard programs or speed of execution are vital.

That review included two test programs, the first one primarily involving loops and comparisons, the second one chiefly arithmetic and function calculations. I have now applied the same tests to the new Microsoft Compiled Basic, with the results (time in seconds) below:

	TEST 1	TEST 2
Applesoft Basic	220	112
Apple Pascal	100	108
Apple fortran	91	109
Microsoft Basic	302 (226)*	108
Compiled Basic	27	75
Compiled Fortran	22	74

* The reduction from 302 to 226 sec. is accomplished by using integer variables in all loops. This is not permitted in Applesoft, and in any case, integer arithmetic actually slows Applesoft down since conversion to floating point is performed first, but it speed up Microsoft Basic considerably. The compiled version also used integer loop counters.

From this, we see that the Microsoft Basic Compiler produces speed quite comparable to their Fortan. In addition, it uses the exact same progam that has been running with the Basic interpreter as a starting point for compilation. The ability to develop programs in Basic, with easy editing (Microsoft Basic includes an EDIT feature much like the famous Progam Line Editor for Applesoft), ability to access all variable values of run parts of programs, and so on, is obviously of great value. The Microsoft Basic Compiler takes the program that has been perfected with the

interpreter and directly produces Z80 machine language code. Also, since the interpreter (and compiler) represent a very complete dialect of Basic, it is easy to take almost any Basic program you come upon and get it running. This allows access to rather large libraries of programs, although not as extensive as Fortran.

The Basic Compiler supports the Apple High-resolution graphics display capabilities of the GBASIC interpreter, as well as calls to machine language routines written using their Macro assembler (which supports both 6502 and Z80 code), or compiled from Fortan (for instance a really snappy matrix inversion routine, or sorting algorithm). You can also call 6502 machine language routines (by having a Z80 program header) such as the program to place characters on the high-res display that appeared in Contributed Volume 3.

There are a few constraints on your Basic program to permit compilation, but they all reflect good programming practice anyway. For instance, you have to DIMension arrays explicitly (eg. DIM A(40) rather than DIM A(N)), and in translating programs from Applesoft (there is a utility to bring files over from DOS, either 13- or 16-sector disks), you should replace index variables with integers. This is most easily done using a text editor and macro commands. It really works, by the way. I took one large <>600 program statements) scientific program that iteratively computes sample composition from X-ray intensities, using lots of loops and lots of math, and had it reworked, copied and running in less than an hour. The execution time for one typical set of data dropped from nearly 16 minutes to 6 minutes (the same program in Fortran takes 15 minutes in Apple Fortran and 6 minutes in Microsoft Fortran, but translating and debugging it from Basic took weeks!).

It is hard in a brief review to list all of the features of the CP/M and Basic Interpreter/Compiler environment that I like, or that might prove important to someone else. There are many, including ~~a huge improvement, in disk reading and writing speed compared to Apple DOS, ability to combine~~ Basic, Fortran and machine language, convenient Basic commands for the Apple buttons, speaker, and so that apparently wouldn't fit into Applesoft, and a really complete Basic (PRINT USING, for example, and double precision). You can even write programs with extensive run-time error handling using ONERR commands, and then compile them. This capability is not even readily achieved in Fortran. The only thing I do not like about the Microsoft-supplied programs is the text editor (ED), which is basically a teletype-oriented program. I have purchsed VEDIT, which is a screen-oriented editor that supports both the Apple 24x40 screen and my Videx 80x24 screen. It is a convenient way to work on programs in any language, including Basic. My entire investment, by the way, is less than that for the Apple Language system and Fortran, plus I can back up my disks, too.

In fairness, I should mention a few things I don't like about the Microsoft system, as compared to good old Applesoft. Microsoft gives you only one hi-res page, so animation is difficult, and the DRAW command is missing. There are no keyboard 'escape' sequences to trace over program lines of data inputs. Software interfaces of intelligent peripherals like the Graphics Tablet are not yet available, and I either will have to write my own, in Z80 code, or wait for someone else to do so. But by and large these drawbacks are minor and the advantages are substantial.

Once you've tried a real disk operating system like CP/M, Apple DOS will seem very limited and awkward. And once you have timed a compiled program on some big job, you will be impatient with interpreters like Applesoft and USCD Pascal (there is, by-the-by, a real Pascal compiler that produces native code for the Z80!). All this is nearly enough to make me trade in my beloved and well used Apple for Cromenco, Ithaca or some other Z80 machine, but fortunately the folks at Microsoft have let me have the best of both worlds. Now if there was just some way to squeeze another 64k of memory into my Apple II!

CLUB OFFICERS

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available and after
10:30pm local time.

Membership is open to all. Dues are $12.00 annually with a one time initiation fee of $5.00 at the time of admission. Membership applications are available from the club Secretary at the meetings or by mail.

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MEMBERS AIDE

The members listed below have volunteered to answer questions from club members who need a 'HOT LINE' type answer that can be answered over the telephone. Please try to be brief when you call as a courtesy to them. Their names and phone numbers are listed below. The numbers after their names represent their special talents. PLEASE-NO CALLS after 10 pm.

Paul Stadfeld————	312-359-2378	4-9
Guy Lyle————	312-438-7941	4-9
Earl Allen————	312-837-9259	1-9
Ted Rosemann		
Mary Rosemann————	312-338-4833	2,3
Joel Kurasch————	312-677-8358	9
Leon Alexander————	312-725-5309	0
Gordon Banks————	312-324-6194	0,8
Rich Lundeen————	312-420-2008	2,3

Mach. Lang=1	Int. BASIC=2
Applesoft =3	Hardware =4
Arrays =5	DOS =6

All of above=9
PASCAL=0 ,Z80 CARD=8(are not included in the 9 designation)

When numbers appear before a 9, the person is especially qualified in that area as well as in all other areas.

TREASURERS REPORT

Month ending Feb 28,1981

December Ending bal.		$ 818.42
Membership	40 new	
	7 renew	703.00
Newsletter		<219.73>
Disk project-receipts		1054.83>
Various expenses		<1045.62>
February Ending Balance		$1310.90

Respectfully submitted,
Jim Wilson, Treasurer,
March 2,1981.

SECRETARY'S REPORT

Meeting of March 7, 1981
Attendance: 215

The meeting was called to order at 10:00 a.m. by Program Chairman Ken Rose. He then turned the meeting over to President Dave Alpert, who briefly discussed our new meeting facilities.

Librarian Jim Pfieffer then gave a detailed explanation of the new method by which club disks are being distributed. The method that Jim has instituted is so successful, that almost 400 disks were sold at the last meeting (a trial tally after the meeting showed that we did at least as well in March). The paper library is also in the process of being overhauled, and an index of the material will be available soon.

Paul Stadfeld, chairman of the hardware evaluation committee, explained what his group was doing and asked for comments from any members on any piece of hardware they may have used.

Rod Stewart, chairman of the software evaluation committee, presented the work his group was doing, and also requested volunteer help.

Terry Tufts, the Harvest newsletter's editor, requested not only articles for the publication, but typists to input them into a text editor. He asked that, wherever possible, articles be submitted on disk, using any of the more common text editors around.

Secretary Joel Kurasch, reporting that perhaps as many as five percent of the newsletters did not get delivered this month, stressed the importance of having the correct spelling for the names, streets, and cities, of each of the members. Of utmost necessity is a zip code. The newsletter may be going out as third class mail shortly, those without zip codes will not get through. Corrections can be given to the secretary at the meetings or mailed into the club's post office box.

Treasurer Jim Wilson gave a report on the club's finances.

At 10:40 Paul Stadfeld demonstrated to the membership, how he had built a hardware switch which enables him to change from 3.2 to 3.3 and back. It requires a reboot of the system whenever the switch is activated, and will not allow the transfer of data between the 13 and 16 sector format, but is very useful for those whose home libraries are split between the two releases of the DOS operating system. Paul stressed that the potential for damage to the chips is great, and that unless one knows thoroughly what one is doing, this sort of modification should not be attempted. As part of his demonstration, Paul created a series of diagrams in hi-res graphics, using the character generator from the DOS Tool Kit. These graphics created an interest in the group for a demonstration in the generator's use, and we expect to have it soon.

At 11:10 Eric Stral discussed the purposes of the SIG (special interest) groups. The four main ones that now exist are business, stocks and options, education, and Pascal. Anyone interested in other areas should contact Eric, and if enough interest is generated in an area, the group will form.

At 11:45, after a break, a debate was held between Jim Wilson and Ken Rose on the propriety of copying proprietary software. After the debate, comments were taken from the membership.

At 12:25 Chuck Anderson reported on some of the newer games available for the Apple. Included in his discussion were Puckman, Missle Defense, Space Eggs, Warp War, and Hi-res Cribbage.

At 12:30 Mr. Apple and his friend (Harlan Felt, of Apple Computer Company), answered questions about the Apple, the upcoming computer show, and the meeting of the International Apple Club.

The meeting was closed at 1:00.

As of the end of the March meeting, the membership has expanded to 315.

Respectfully submitted,
Joel Kurasch
Secretary

EDITORIAL

This has been another busy month with some interesting articles arriving on my desk at the last minute.

John Russ has written another useful comparison of the various systems and languages that can be run on the Apple II. I hope you find his results as interesting as I did. The Z80 card allows the Apple users to have the best of both worlds and I will be interested to see what directions this leads. Perhaps a CP/M SIG will be next.

By the way there is also a 6800 Card that has been designed to go into the Apple. Has anyone been using it?

Also Solid State Music has announced an IEEE Interface card. This is an interface developed by Hewlett-Packard which they called the HPIB (Hewlett Packard Instrument Bus, also masquerades under the name GPIB or General Purpose Instrument Bus.) This is a parallel connection system that allows multiple devices to be connected in parallel to the computer. Each device is given a unique address so it is possible for each to communicate with the main computer. Most instrument manufacturers conform to the IEEE standard so the possibilities for the Apple to control and receive data from instrumentation is greatly enhanced. Perhaps we have members who are involved in such applications who would like to share his/her experiences in the form of an article for Harvest.

I am very pleased with the response of members who have volunteered to type articles. Their assistance will no doubt be reflected in a Harvest that has more pages and articles that cover a wider range of interests. I can still use volunteers who would like to assist in doing paste-up of the actual finished product.

FEEDBACK-we need FEEDBACK. I have had one comment that we did not have enough reviews of software. I appreciate the comment and hope we can remedy that problem soon. I expect the Software and Hardware Chairmen Paul Stadfelt & Rob Stewart will soon be be working full speed and will have interesting articles to share with us all. If you have any comments or suggestions please send them along.

I'm sure many of you are looking forward to the coming shows. The NCC should be a very interesting event because many of the companies time announcements of new products to coincide with the show. Is it possible that Apple will announce a hard disk system?

The Apple Caravan will undoubtedly be of very specific interest to us Apple users. Though I must say that I kind of balk at paying a fee to see products that people want to sell me. I understand the computer stores are limited to 100 free tickets. I have to wonder if Apple isn't being pound wise and penny foolish in their promotion scheme. Hewlett Packard and others have been offering free seminars on a wide range of subjects. Perhaps they have something to teach Apple.

A brief note to valued contributors. I would appreciate, if at all possible, receiving your articles submitted on disk. I can handle articles in EasyWriter, Applewriter, Magic Window, PIE. My preference is for Easywriter for a number of reasons. If you don't have a word processing package and would like to know more about them I will be happy to show you how they work and how they can assist you in making your computer more productive.

I try to go to the printer two weeks before the next meeting. If you wish to get notices etc. in a specific issue please try to get them as early as possible prior to that time. Deadlines for the next coming issues are:

April 17
May 21

CATALOG ROUTINE

Here is a nice little routine you might want to put in your "HELLO PROGRAM" . It allows single key entry to get the CATALOG displayed on the screen. Note you must have the DOS functioning for this routine to work.

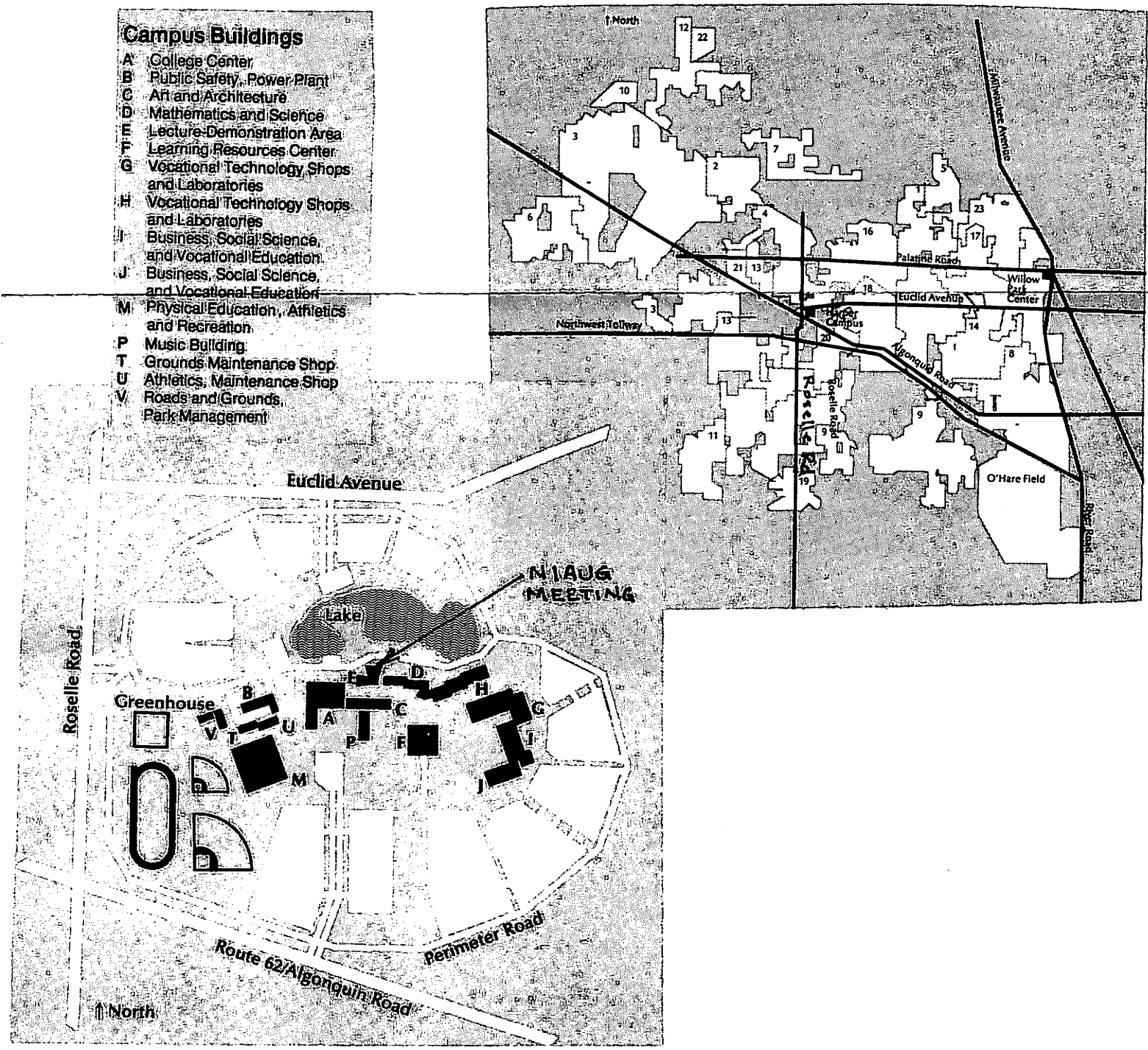
```
POKE 1013,76

POKE 1014,110

POKE 1015,165
```

Press "&" to get CATALOG

WARNING,WARNING ! ! !

The parking at Harper is in designated areas only! Please use the student parking only. The parking areas are well patrolled and any tickets handed out are for the Palatine Traffic Court and cannot be fixed. Notify the Campus Security Department, if you need to temporarily park while you are moving equipment etc., and they will be happy to cooperate.

The meeting will be held in E-106 at 10:00 am.



SPECIAL INTEREST GROUP NEWS

The Special Interest Groups (SIGS) are really getting up steam. Eric Stral is now co-ordinating efforts to see that any new group gets the assistance needed to get organized and off to a good start. If you need help, have any suggestions, feel free to call Eric. (P.S. he gets a little testy about calls after 10:00 p.m. or so I am told.)

The Business SIG has been meeting monthly with about 14-20 people in attendance. Topics have included Word Processing, Visicalc & Data Base Management Systems. The March meeting will cover Income Tax Preparation programs. The meetings are now being held in the Mount Prospect Library which is very conveniently located for most members. The next meeting will be held April 18, at 9:30am.

The Stock, Options, Commodities, Group has been faithfully meeting. No one is saying too much so it is safe to assume that they have all become gnomes counting all their profits. Whoops spoke to soon, the next meeting will be held at the home of Larry Bradley, 1230 Newcastle Ln, Hoffman Estates, 882-257.

The Education SIG has a small hard core group of 8-10 who also have been faithfully meeting at the Tufts' house. (We are afraid to change locations now that Karen Nelson has just about learned to navigate by herself.)

EDUCATION SPECIAL INTEREST GROUP MEETING

The Education SIG will meet April 15, 7:30 at the Tufts' house. Discussion will be "What qualities should a good Education Program Possess". For more information call Helen Tufts at 392-7735

ADVENTURE SIG-Joel Alpert is interested in getting the Adventure SIG going. Give him a call at 312-295-6078, if you are interested. This should be a good chance for you to try out your new Eamon disks.

Other SIG GROUPS-if you are alive and well please send us notes of what you are doing and how others may participate in your activities!

APRIL AGENDA

March 7, 1981

10:00-10:30am Opening remarks
(Dave Alpert)
10:30-11:15am Voice of the Apple
11:15-11:30am Break
11:30-12:00pm Disk Drive Technology
(Mike Robins)
12:00-12:30pm Ampersort
(Ken Rose)
12:30-12:55pm Ask Mr. Apple
12:55-1:00pm Closing Remarks

SIG INFORMATION CONTACT LIST:

Business- Eric Stral 312-885-1941
Education-Helen Tufts 312-392-7735
Stock Options-Jerry Guerin 312-945-2624
Z80-?????
Hardware?????
Forth????
Pascal-???
DOS ????
Beginners???
OTHERS?????????

MORE FROM THE LIBRARIAN!!!

Those people that got disk 20 that was missing a file may bring it to the meeting to have it updated with the correct information.

Word-Search Puzzle

D A P T I B Z C T H
B A U D E K S I D H
S S F D V T N S P R
R E O H I I Y A S E
E R R N D O T B I T
T I T M E D O M L U
N A R P O L L O D P
I L A C S A P R A M
R F N T O L I P P O
P L H T R O F M A C

Find these Hidden Words:

COMPUTER	APPLE	BIT
BYTE	RAM	ROM
BASIC	DISK	MODEM
PASCAL	PILOT	FORTH
PRINTER	LISP	SERIAL
FORTRAN	BITPAD	VIDEO
PLOT	CPM	AUDIO
BAUD	INIT	

PREZ SEZ!

What a difference a room makes. For the 220 or so who attended our first meeting at Harper College, it was a delight to be able to see and hear all that went on. With four color monitors, an over head transparancy projector and a real sound system, we were treated to sights and sounds we were not previously used to.

It all started with George Makis, Mike Robins and Don Fuller. George is a faculty member, as well as a club member, and introduced us to the facility and to George Dormer another faculty member. One thing led to another and Harper agreed to allow us to hold our meetings there. Enter Bill Newman of Harper. We can't thank him enough for his help in setting up the facility and making certain that all systems worked. I know how hard it is to put on a seminar for just 80 people let alone 200-300. Just getting the equipment to work right is hard. For 200+ it takes a little magic. The Apple is not the most compatible beast when it comes to interfacing with video distributors and multiple monitors and the like. Bill did it all and everything worked without a hitch. Thanks Bill for a job well done.

Plans for the IAC meetings in May are going well. Tickets for the seminars to be conducted Sunday May 3rd, will be available at our April 4th meeting. The price is $5.00 in advance and $7.50 at the door. Plan to purchase yours at that time as seating is limited and only a limited number of tickets will be available at that time.

By the time you receive this issue of the newsletter, our Peoples Message System should be up and running. It was written by Bill Blue and has many more features than our old ABBS. One important service available is upload and download of programs. Now you can leave articles for the newsletter on the system as well as receive the programs that are printed in the newsletter. We also intend to have a 'best of the month' program for members to receive. These programs will be taken from the best of those submitted from the club membership.

Hats off to Rob Stewart who accepted the chairmanship of the Software Evaluation Committee. Already he has organized a group to write articles for the newsletter and to prepare presentations for the meetings.

Notwithstanding that, Paul Stadfeld has done the same for the Hardware Evaluation Committee.

Lastly is the fact that an overwhelming majority of the membership voted to hold a May meeting even though it would be held the Saturday (May 9th) after the IAC seminars and the four day NCC and Personal Computing Festival. That's a lot of computer time. It is impressive to see that you still want more even after all that!

Dave Alpert

WANT ADS

For Sale

1) Trendcom-100 printer with interface card. This printer has full upper and lower case character set. $325
2) Videx 80 column adapter. Gives the Apple a 24X80 screen display. $300
3) M&R Sup 'r' Mod II. Puts video output on channel 33 on a TV set. $20
4) Programmer's Aid #1 chip. $35

Call Joel, 677-8358, evenings.

PC Boards for "GALFO's HAM CW/RTTY program. My apologies to the people who ordered the first ones. The original circuit had too many problems. This one works great and for only $15.00. Wired and tested boards are also available.
Burt Wagner 312-772-4886

Programming Lessons Wanted
Professional Photographer will exchange photograpy lessons for programming lessons on the Apple.

Dick Dienethal 312-696-2448

Game Players Wanted
Want to know if there is anyone in Elgin area who plays computer games on the Apple

Bob Ritz 742-0381

HOWARDSOFT'S "TAX PREPARER" -A REVIEW

by Bob Werner

1981 Tax Preparer. Requires Apple II computer with 48K, Applesoft ROM, usable with 1 and 2 disk drives. Cost:$99.00. Available locally at dealers or directly from Howardsoft in Los Angeles.

I personally am more interested in acquiring turnkey type, well prepared computer programs to use with my Apple than to devote the time necessary to create a usable package myself. Late last year I investigated all of the advertised computer programs available for doing personal income tax and preparing the 1040 forms. These ranged from the very simple to a number of programs that were not only rather sophisticated but in the range of several hundred dollars each. I spoke with either the sales representatives or the people who had allegedly prepared the programs. I knew what I was looking to accomplish with a computer program, if it were possible, and hence proposed some specific questions that needed to be addressed.

I wanted a program that could handle the long form 1040 schedule, as well as just about every other schedule or form that might input into the 1040. If possible, I wanted to be able to maintain records during the year. Hence, for my own personal tax report I would in effect be utilizing an active data base into which the ongoing information was recorded. I found, when using a good data base management system, that some of the particular information necessary to be recorded for good tax planning and records keeping posed problems for that computer program. Specifically, the length of titles or information associated with individual data entries used up too much file space. Consequently - 3, 4 or even 5 disks might have been necessary to store all the files. Obviously, the general data base management systems were not the answer.

Several tax systems were available which handled most, but not all, of my requirements. I settled on the "Tax Preparer" because it handled more of the forms I wanted to work with, could print out the forms if desired and was initially cost effective. They increased the price from the advertised level and will apparently be increasing it to $150 in April, 1981. It is neither the most expensive nor the least expensive program— although after April it will become more difficult to justify its use by other than people using it in a tax preparer application.

The Tax Preparer comes with two (2) disks, one being the program disk and the second being a specially formated disk for use on one-drive systems. They have previously and in the future plan to update from year to year, at reputedly "reasonable" cost (which was quoted at something like $35).

The program handles the entire Form 1040, as well as Schedules A, B, C, D, E, F, G, R, RP, SE and TC.

It also handles Forms 2106, 3468, 4562, 4726, 4797, 5695 and 2210. For an additional $69, a Form Supplement Package is available to handle forms 2119 (sale of home), 4625 (computation of minimum tax for individuals) and 6251 (alternate minimum tax). A personal complaint is that the minimum tax forms were reputedly in the package as it was first discussed with me last December.

The documentation is reasonably prepared. The initial use of the package would be easier if some additional information had been provided relative to the creation of files, how to handle certain error deletion problems and methods to identify files and subfiles with titles.

It doesn't handle the tax forms easily where the tax payer is a dependent listed on his parents' 1040. In my opinion, one needs to be very careful when working between Schedule TC and lines 32, 33 and 34 of Form 1040 because of the particular method that the program utilizes input from Schedule TC and dependents deduction. My question to Howardsoft has yet to be resolved in this area.

In general, I found the program to be very good. It generates the 1040, line by line, on the screen, permitting you to verify, modify, delete, append or itemize data or files as you go along. It has reasonably good error trapping capability. There are some place where one can get frustrated because it is difficult to easily delete an entry. It is sometimes confusing when shifting from Form 1040 to some of the schedules or other forms that need to be input into the 1040.

Its claims that lists can be easily created and itemized with sums computed and entered on the proper lines is valid. This is perhaps one of its strongest features. It does have good full feaure editing of the data. The math, in linking the forms, is performed automatically. However, as noted above, I have encountered some difficulty in getting the calculations linked from one form to another automatically. This complaint and a problem where I found some errors in calculating depreciation, may be due to my lack of experience with the program, rather than the program itself.

The forms are easy to complete and it will step through each of the IRS forms and schedules line by line. Hence, the format is simple.

In my judgment, one could sit down with his raw data and create tax files and tax report without having to go through the creation of individual separate draft schedules. Having used the system three times (for two dependents, as well as my own returns) I found one learns by doing.

The strongest feature of interest to me was the ability to maintain detailed files and subfiles during the year. We were able to keep track of different types of dividends, interest, income form various sources, detailed donation lists, etc. with great ease. For example, if you make periodic donations to your church, they can be accumulated in a subfile entitiled "Church Donations" that would input into the Contributions sections of Schedule B.

The program tends to run somewhat slow, although in some areas it is actually doing some massive computing while one believes that it is "hung up". There is a great amount of material on the program disk, so that it is virtually loaded.

One can over-type (type too fast) input material and overrun the program's capability. When this occurs the delay is excessive. That is perhaps the most significant complaint on the program.

If one is aware of the tax rules, or at least some of them, the program is substantially easier to use since it was not designed to replace knowledge of the IRS Regulations. However, if you can understand what is necessary to include in the 1040, then the program is outstanding. It has been utilized by professionals in their work.

It will print out the various forms as required by the IRS. If one has a printer capable of handling the type of format required by IRS, then you can generate your tax returns directly. It will also print out onto clear plastic film which can be overlayed onto the standard 1040 forms as well. In addition, it will print out all of the supplementary schedules necessary to accompany the tax forms. You can print out your work sheets or drafts of your work, if desired.

In summary, the program is reasonable in cost, capable of being utilized by a peron with some knowledge of the tax law, and is usable by tax preparers. It will not prepare partnership returns or the K-1 forms. Unless the auxiliary forms package is ordered, it doesn't handle the minimum tax calculations directly or the complications generated by the sale of a home.

You can use it to develop alternate tax strategies and play the "What If" game. In this respect it doesn't provide a nice comparison printout or video presentation such as found in Apple's Tax Planner, but it will enable much more effective use to be made of the Tax Planner because your data base will be easier to develop.

Personally, I am pleased with my investment.

Diskette Nibblizing

by Chuck Andersen

Data that is stored on a diskette is encoded into nibbles. There are 34 possible nibble combinations. However 2 are reserved for the address and data field markers. When encoding data, 256 eight bit bytes are split up into 410, five bit nibbles.

When writing nibbles to the disk it takes 32 microseconds to shift out the 8 bits plus the one extra shift that produces the trailing zero. A nibble is read from the shift register. It knows it has read a full nibble when the register is all "1's". This means the nibble is fully shifted in. Before the shift is started the shift register is zeroed. All nibbles from the disk have a "one" in bit position 7. This makes it easy to tell when the shift is complete. Every 4 microseconds a bit is shifted in. To fill the shift register it takes 32 microseconds plus an extra 4 microseconds for the trailing zero, making a total time of 36 microseconds.

Below is a layout of one sector of a typical diskette:

SYNC	all $FF'S
ADDRESS MARKERS	$D5,$AA,$B5
ADDRESS FIELD	4 pairs of nibbles, vol, track, sector, checksum
ADDRESS TRAILOR	$DE,$AA,$EB
SYNC	approx. 14 sync nibbles
DATA MARK	$D5,$AA,$AD
DATA FIELD	actual data nibbles 410 nibbles 256 bytes
CHECKSUM	checksum of data EOR of all data nibbles
DATA TRAILOR	$DE,$AA,$EB
inter-record gap leading to next sector	

We are now going to define some of the more common terms used: RWTS (Read/Write Track/Sector) is the mainline program that reads or writes a sector of data to or from the diskette.

RW/DISK (Read/Write Disk) is a group of subroutines which do the actual reading or writing of nibbles and also control the disk hardware. The six major subroutines are:

PRENIBL - Converts 256 bytes of real bytes into 5 bit nibbles. These take up 410 bytes of memory.

WRITE - this takes the 410 nibbles and writes them out to the disk at its current position. They form one sector. These 5 bit nibbles are converted to 8 bit bytes before being written out to the disk. Each nibble is EOR (exclusive or'ed) with the previous nibble before being converted and a checksum byte is put at the end.

READ - to read the nibbles off the disk the controller looks for $D5,$AA,$AD which is the start of the data field for that sector. Then it reads the 410 bytes off the disk and converts them back to 5 bit nibbles as they are put in the nibble buffer. To make sure no reading error has occured it checks the checksum and the data trailer.

READADR - This routine reads until a sector header is found which is marked by $D5,$AA,$B5. It then reads in the vol. number, trk number, sector number and checksum from the header and checks for the address trailer $DE,$AA,$EB, at the end, to be sure it was read correctly. The vol,trk, and sec are passed back to RWTS which uses them to find the sector it needs to read or write.

POSTNIB - Converts a buffer of 5 bit nibbles to real bytes and stores them into a page of memory.

SEEK - This moves the head to a specified track. This routine assumes that the current track information is correct. As it moves it delays the correct amounts to make sure the head got positioned properly.

The data in the 256 bytes of memory goes through several changes before being written to the disk. The steps that follow describe these different states are:

1.Prenib converts the 8 bit memory bytes to 5 bit nibbles, then they are stored in a buffer at address locations $BB00 to $BC99 inclusive. We now have 256 bytes stored as 410 nibbles.

2.The write routine EXOR's each nibble with the previous one and then converts the nibbles to 8 bit (disk) bytes using the table at $BC9A. These "bytes" will have the following properties:

a. Bit 7 is always a one.
b. There are no two consecutive zero bits in the byte. As an example $AA is allowed but $CC isn't. At this point the disk bytes are written out onto the disk itself.

When it comes to reading the nibbles off the disk they are converted back to 5 bit nibbles immediately and EOR'd with the previous nibble to get the original nibble back and then postnib converts them back to real bytes to be stored in a page of memory.

I hope this information will be helpful to you in understanding the disk operating system a little better than before.

This article is taken from:
Apple Bits
6140 Glenwood
Mission, Kansas 66202
November, 1980

DOS TOOL KIT

By Tom Vanderpool

After seeing the DOS TOOL KIT advertised for several months in various magazines, I finally found it at a local computer store. I must have taken the title too literally, because it seems more like an Applesoft Tool Kit than a DOS Tool Kit. It requires either an APPLE II+, an Apple Language or Andromeda 16K Board or an Applesoft card. It will run in 32K, but it is recommended to run on 48K (most of the demo programs will not operate in less than 48K). These programs require 3.3 DOS (like most new programs will) and the manual specifically states that these programs are not for the novice programmers. The price is $75.

The DOS Tool Kit includes:

EDITOR/ASSEMBLER
APPLESOFT PROGRAMMER'S ASSISTANT
HRCG (HIRES CHARACTER GENERATOR)
ANIMATRIX
MAXWELL
RIBBIT
SKYLAB
APPROXIMATELY 20 CHARACTER FONTS

If nothing else, it makes quite an impressive Catalog when first looking at the disk. When I finally got enough courage to run the various programs, I was very impressed with the quality. Apple does it again! And documenation too! You receive two different manuals with the disk. One is on the HRCG including the Applesoft Programmer's Assistant, and the other is on the Editor/Assembler. Both are up to prior Apple documentation quality.

The Applesoft Programmer's Assistant will allow you to massage an Applesoft program that is in memory in the following ways:

PLACE A PROGRAM ON HOLD
MERGE THE PROGRAM ON HOLD WITH ANOTHER PROGRAM
FIND THE LENGTH OF THE PROGRAM
COMPRESS THE PROGRAM
ALLOW CONTROL CHARACTERS TO SHOW
AUTOMATIC LINE NUMBER
FORBIDDEN KEYS
VARIABLE CROSS REFFERENCE

These commands are invoked by using the '&' utility. Most can be used with the '&' and one letter for instance, &(H)old (the 'old' being optional in this case). The first two commands look very familiar to those that have used the orginal Applesoft Merge program. It seems to be roughly the same routine, which has worked pretty well when I had the opportunity to use it. The LENGTH COMMAND returns the length of the program in Decimal and Hex values. The COMPRESS COMMAND will delete all REM's from the copy of the program that you are working on, letting you keep one that is fully documented and one that will run faster without Remarks. You also have the option of having your control characters show in the list of the program allowing you to check for CONTROL-D within quote marks, etc. The & Key commands allow such neat and clever things such as underscore, backslash, and the left square bracket.

THE CROSS REFERENCE COMMAND

By typing &X a list of all the variables in your program and the lines that they occur on will be compiled. This is very handy, and can save a lot of time if you need to change variable names for one reason or another. If it is a rather long list, you can interupt the listing by CONTROL-S. The variables are listed as Applesoft sees them, just the first two letters and the kind of variable (Integer, Real or String).

You also have available an AUTOMATIC LINE NUMBERING ROUTINE, just like the one you got used to using in Integer Basic. With this command, you can specify the beginning line number and the increment you want. If neither are specified the default is Start 10 and Increment by 10. There you have the Programmers's Assistant. A good cross section of utilities to edit programs with.

The HiRes Character Generator

With the HiRes Character Generator, you are able to use character sets designed with a program called Animatrix to draw all pictures that you heart desires. Two good demo programs are Ribbit and Maxwell. These programs demostrate how the character sets can be used within a program and some of the things that can be done with a little imagination. If you are not in to drawing pictures, but would rather have a different look to your Apple print, then your in luck too. You are supplied with over 20 different charcacter sets for the text output of the Apple. Some of the ones to choose from are Byte, Greek, Count, Katakana, Outline, Pinocchio, Pudgy, Roman, and Slant. Oh yes, Upper and Lower Case are present. It's getting more interesting all the time, isn't it? On the outside chance that you still need a set that is not described for you already, you can run Animatrix and describe the set that you need. You have 10 different character sets available to you at any time by typing CONTROL-A N, where N is the character set in memory. Also available are NORMAL and INVERSE MODES, OVERSTRIKE, COMPLIMENT, TRANSPARENT and REVERSE OVERLAYS that may use either or both pages of text. When using Animatrix to display shapes or form you can use several letters typed together to compose a shape. For instance, a 4 by 4 group of letters printed together could represent the Apple Logo.

There is also a provision to make RELOCATABLE ASSEMBLY LANGUAGE FILES, so that a binary program will run on a different size Apples.

The EDITOR/ASSEMBLER

The Editor/Assembler does not require Applesoft in ROM or the Language Card as do other programs on this disk. The manual warns to make a backup copy of the disk before using the Editor/Assembler. Anticipation of disastrous results, I suppose. The Editor is not intended to be a word-processing editor, but should be used for program developement. The estimate is 700-1400 lines of program in a 48K machine, depending primarily on the number and length of the comments. If you are familiar with the TED II+ assembler this one should be no problem. It seems very similar in most respects. As the Apple Mini-Assembler, you have available a multiple of commands. For instance, three L's typed in immediate mode will disassemble three groups of 20 instructions and display them for you. A CTRL-R command repeats the last list command that was given, no matter where it was given. There are direct DOS Commands available by using a '.' to denote that the next command is to be interpreted as a DOS Command. If you become frustrated by all the different commands and the syntax required for them you can ask for help by typing '?'. A list of the commands and their formats will then be shown.

The EDITING COMMANDS are:

ADD	INSERT
COPY	LIST
CHANGE	PRINT
DELETE	REPLACE
FIND	

As would be expected, the ADD command adds lines to the listing. If the line number is not specified, the default is line 1 with no program in memory and the next available line number if there is a program in memory. You may specify a line number within the program itself to add lines to the middle of the program without a major rework of the program. The COPY command copies a specified amount of program from one place in the program to another spot in the program. This allows moving a subroutine to a different place in the program with a minimum amount of effort. The CHANGE command lets you replace one string with another string. You may specify line numbers if you wish. If none are specified the default is the whole program. You are then prompted 'ALL OR SOME', which is a query to find if you want every occurence to be changed or step through one at a time and decide for each occurence. The DELETE command is just that, and needs a range to be specified or an error will be generated. The EDIT Command will display the specified line number ready to receive changes. Within the EDIT Command you have REPLACE, INSERT, DELETE, RESTORE, and FIND at your disposal. These are all triggered by use of control characters (CTRL-I, CTRL-D, CTRL-R, CTRL-F). A REPLACE is accomplished by a direct substitution under the cursor. The FIND command allows you to find a string within a specified range of line numbers. The INSERT command allows you to insert line numbers into the program at any given line number and automatically moves the rest of the program down a like amount. The PRINT command is like the LIST command but does not print the line numbers. The REPLACE command allows you to replace a rangelist with the specified range.

OPERATING Commands include 'CAT' for CATALOG, LENGTH which displays the amount of memory currently in use and the unused portion thereof, TRUNCATE, TABS, WHERE, and END. TRUNCATE will stop the display at 40 characters but will not delete the missing characters from the file. TABS is very simular to the Tab setting on a typewriter. The WHERE query will find the hex address of a line number specified. The END Command is the only way to leave the Editor/Assembler cleanly.

Assembly is accomplished by the ASM command. The Assembler, being another program on the disk, is loaded on the command ASM. Because of this, the program needs to be in a text file that is on line (ED-disk). In the Assemble Mode, you can date the name of the TEXT FILE to be assembled and optionally, you may specify the OBJECT FILE NAME. While assembly is proceeding, the space bar can be used to stop or single step through the process. The Assembler allows LABELS, CONSTANTS, AND ARITHMETIC OPERATORS. It even supports DO, ELSE, and FIN for optional subroutines.

A very short one page description of program editing is given. It was a very off-handed 'oh, by the way' type of remark that set me thinking. It seems that if you make a TEXT FILE of your Applesoft program, the Editor can then read and act upon the program. The program can be converted through the use of CAPTURE to a text file. This is a very good way to make use of an EXEC FILE, or to use the Editor directly. Once you have the program in the editor you are able to use all the search and find routines with global and selected local replacement. Now, think for a moment about a cross reference command in the Applesoft Programmers Aid and the power of various routines in the editor. Impressive isn't it? I'm sure that the more I use this disk of routines, the more I'll like it.

There are several other features and nuances that are described, but I have not had time to explore them as yet. After the initial disappointment of not being what I had imagined, I'm happy to say that I have recovered quite nicely thank you. If you are an Applesoft programmer I would recommend these programs.

IAC NEWSLETTER NEWS

by Mike Robins

This is a summary of the International Apple Corp. Newsletter. This newsletter is published whenever anything of interest falls between the publications of the Apple Orchard. It is also a means of getting information out to all clubs in a timely fashion. Bernie Urban, the editor of the Newsletter talks mainly about the SIG (special interest groups) of the I.A.C. He mentions that Ted Perry, Chairman of the Education SIG is in the process of collecting project information about State Funding, as well as Federal Funding under title 4C, Bureau of Education for the Handicapped, National Science Foundation and others.

Dave McFarling of Lincoln, Nebraska, 402-467-1878 is now the chairman of the Handicapped SIG. He is very interested in getting volunteers to handle areas dealing with specific special needs, e.g. deaf/hearing impaired, blind, learning disabled, etc.

James E. Hassler's Ham SIG meets every Sunday night on 14.329 MHz at 0100 Zulu (8 pm East Coast Time) net control WB7TRQ located in Cheyenne, Wyoming. His group boasts a membership of over 200 Hams. They run an exchange with any club.

Neil Lipson, who is chairman of the I.A.C. Newletter reports that the library has over 650 newletters representing some 9000 pages of Apple material. He is averaging about 3-4 requests per week for information on the library. Also available are 305 different articles (1400 pages worth). Listings are available to member clubs and he will provide copies at $.06 per page. Present address is 1646 Harper Ave. Redondo Beach, Colo. 90278.

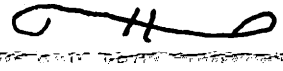
Randy Field, chairman for New Club Assistance, will provide materials for newly formed or soon to be formed clubs which will include such things as a sample constitution and by-laws, club organization recommendations, suggested officers and committees, as well as ideas for activities and ways to attract new members.

Craig Vaughan and Mark Robbins, the Standards Committee, are working on standards for transferring files. They also reported that the Source Apple Users Group is working on the development of on-line libraries with the ability to transfer articles. They are considering publishing an electronic magazine.

Tom Woteki of Washington Apple Pi, 202-547-0984 has started a Language SIG. He is looking for volunteers who will handle APPLE Forth, Pilot, Fortran or whatever. He hopes to have a series of lectures or panels prepared in time for the IAC annual meeting in May in Chicago.

P.O. Box 1493,
Beaverton, Oregon 97075.

I would like to thank Bernie Urban for his efforts in letting all the Apple Users Groups around the country stay more informed. I believe through his effort, and the people who help him, that the club members will begin to participate more in making of a great organization, the International Apple Corp.



THIS IS THE EXEC FILE CREATOR WHICH SHOULD HAVE ACCOMPANIED THE PROGRAM LIST FORMATTER ARTICLE IN THE WINTER ORCHARD

```
10 D$ =  CHR$ (13) +  CHR$ (4): PRINT
    D$"OPENFP LIST"D$"WRITEFP LI
    ST"
15  PRINT "POKE 0,PEEK(103):POKE1
    ,PEEK(104):POKE2,PEEK(175):P
    OKE3,PEEK(176)"
20  PRINT "POKE104,PEEK(176)"
30  PRINT "IF PEEK(175)=255 THEN
    POKE 104,PEEK(104)+1"
40  PRINT "POKE103,(PEEK(175)+1)-
    INT((PEEK(175)+1)/256)*256"
50  PRINT "POKE PEEK(103)+PEEK(10
    4)*256-1,0"
60  PRINT "POKE PEEK(103)+PEEK(10
    4)*256,0"
70  PRINT "POKE PEEK(103)+PEEK(10
    4)*256+1,0"
80  PRINT "RUN PROGRAM LISTING FO
    RMATTER"
90  PRINT D$"CLOSE"
100  END
```

INTERNATIONAL APPLE CORE ™

JANUARY 10, 1981

TO: IAC MEMBER CLUBS

from: IAC Board of Directors
Harlan Felt
1981 Annual Meeting Co-Chairman
IAC Region 2 Director

THE INTERNATIONAL APPLE CORE
IS COMING TO THE MIDWEST

The 1981 Annual Meeting of the International Apple Core will be held in Chicago on Saturday, May 2nd, and Sunday, the 3rd . It will be held in the Marriott Hotel located near O'Hare Airport. This is just a short ride from downtown Chicago.

This is the weekend preceeding the National Computer Conference (NCC). The NCC is the largest computer equipment show in the world and covers a vast range of hardware and software vendors displaying their products (none are for sale at this show). They cover micros, minis, and maxi computers from APPLEs to IBMs. There are so many exhibitors that they use up all of the McCormack Place exhibition center(which is the largest one in the USA) plus most of the available space in the downtown Chicago hotels. The attendance figures run around the 100,000 mark. There is a section of the NCC dedicated to Personal Computers with their own exhibit area, speakers, etc. that might be of more specific interest to Apple users.

The IAC Annual Meeting will include a general business meeting and seminar sessions with knowledgeable speakers from some of our member clubs as well as from within Apple Computer Inc. We will send out a formal agenda as soon as it is ready.

Start making your plans now to use this opportunity to meet the present and incoming IAC Directors and Officers, some of the people behind the names at Apple Computer, as well as other IAC members from around the World. If you will need hotel rooms etc., please make your own arrangements as soon as possible because space will become hard to find due to the large number of people that attend NCC.

The committee working on this year's meeting is headed up by Dave Alpert (President of the Northern Illinois Apple Users Group) and myself. If you have any comments or input on this matter please forward them ASAP, in writing (so we will have formal copies for the IAC records), to :

1981 Annual Meeting
International Apple Core
P. O. Box 976
Daly City, CA 94017

We look forward to seeing you all in May!

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INTERNATIONAL APPLE CORE ™

BULLETIN

P. O. BOX 976, DALY CITY, CALIFORNIA 94017 USA

We are in the throes of refining long range goals for the IAC and objectives for 1981 and subsequent years. Got any favorites? Get them into your friendly Director (or to Jerry Vitt) by no later than February end. We intend to have them approved by the Board and available for your information by annual meeting time in Chicago.

Speaking of which, it will be held in the Marriott Hotel located near O'Hare on May 2 and 3. This is the weekend preceeding the National Computer Conference. The IAC annual meeting will include the general business meeting and seminar sessions to be given by Apple experts from member clubs and from Apple Computer Inc. Plan to attend.

On the move...

Scott Knaster, one of our Board Directors for Region 3 has joined Dakin5 Corporation.

Product Poop...

Apple Pilot which uses Pascal 1.1 runs fast and has four editors - Text, Music, Graphics and Character Set Generator. Worth a look, particularly by educators.

Apple Computer Inc. is coming out with its own modem. Rumored to have touchtone or pulse dialing capability and dial tone or busy signal detection. Numberous features above and beyond the D.C. Hayes.

Miscellaneous trade papers have reported that Apple Computer Inc. has signed a contract with Seagate Technology (formerly Shugart) for a large order of 5 1/4 Winchester disk drives (5 - 6 m bytes). No information re pricing, availability, etc.

More hot air - there are now two sources for fans to coddle your treasured peripheral cards. One reported on last month is from the M&R folks - the other is from a company called MRE in Chicago. Both are priced around $50.

New Lipson light pen now available which works with 80-character Videx card.

Caution!

The NEC jolly green monitor for the APPLE III will clobber your disks. Plastic non-shielding is the culprit.

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Apple Orchard contributors, please take note. The pay rates for accepted copy has been increased to $60/page for a standard article and $75/page for a feature/lead article. Help us make the Orchard the best Apple magazine going. Remember, please mark your copy "For the Orchard".

Reminder...

Jerry Vitt has his IAC Bulletin Board System up and running. Post your club meetings, items of interest, check in, leave messages or just browse. (214)369-0427.

Bernie Urban, Ed.
February 2, 1981

This article was taken from the
The Cider Press
San Francisco Apple Core
December, 1980

*** NIFFUM ***
(A DOS 3.3 TO 3.2 CONVERTER)

By C.J. Thompson

With the nice set of disk utilities included in the DOS 3.3 package from Apple Computer comes the program MUFFIN, which allows us to transfer a DOS 3.2 diskette to a DOS 3.3 diskette. It works very well indeed, but it constitutes a one-way ticket to DOS 3.3. No method is provided to transfer a DOS 3.3 file back to DOS 3.2.!!!

Why would anyone want to do that anyway? There are probably several reasons. The most obvious one is that some programs will not run under 3.3 without major surgery. And you may not detect that condition until after you have industriously converted your entire library, and written over the old 3.2 file in question. I know that you wouldn't make that mistake, but and I thought that someone else might. Enter NIFFUM (MUFFIN backwards, of course).

The basic scheme, here, is to MUFFIN a copy of DOS 3.2 onto a 3.3 diskette. Then we can load a basic file under 3.3, followed by a loading of the 3.2 DOS file. We then ought to be able to save our basic file onto a DOS 3.2 diskette. I admit it is not elegant, but it works!

The process has two steps, however, the first step needs to be done only once. From then on, you'll be able to NIFFUM your files using only the second step.

STEP 1-

```
 (Boot DOS 3.2)
>CALL -151
*800<9600.BFFFM
*(Ctrl-C)(RETURN)
>BSAVE DOS 3.2 BFILE,A$800,L$2A00
 (Boot DOS 3.3)
>BRUN MUFFIN
 (Transfer DOS 3.2 BFILE to a 3.3 disk)
```

At this point, you should have a copy of DOS 3.2 in a binary file on a DOS 3.3 Disk. The program NIFFUM takes over from there. Enter the program from the following listing into your computer and save it onto the same DOS 3.3 disk that contains the Integer Basic program that you wish to transfer to a DOS 3.2 disk. Do not write protect either the 3.2 or the 3.3 disk at this time.

When you RUN NIFFUM, it will prompt you (to) enter the name of the Integer Basic file to be transfered. NIFFUM then writes an EXEC FILE to perform the required loads and memory move, and then EXEC's the file to make it all happen. Well, almost ALL. After the memory move into the DOS area of RAM, the EXEC function is aborted, so the last two actions must be done manually. At the

conclusion of the EXEC function, you should see the cursor flashing next to the monitor symbol. If you are so blessed, then enter the following:

```
*(Ctrl-C)(RETURN)
>SAVE (YOUR BASIC PROGRAMS NAME),D?
```

Now pay attention to the D? in the SAVE command. Your computer is in DOS 3.2 configuration at this point, so make sure that you have properly formatted 3.2 disk in the drive you designate for the SAVE.

These instructions and the NIFFUM program will only work for INTEGER Basic files, but the general technique should also handle Applesoft and Binary files. I'll leave it as an exercise for the reader to make the appropriate modifications to generalize it. Just remember that Applesoft program files load at $800, so choose another location for the DOS memory move. I would imagine that even text files could be moved in a similar fashion through the use of an appropriate textfile READ/WRITE program on either end of the transaction. You'll just have to be careful with your memory moves to avoid RAMMING the files together.

If you wonder why we didn't BSAVE and BLOAD the DOS directly, without the memory moves, I can only suggest that you try it and see what happens (ED-Dangerous!). The Apple refuses to cooperate when you try to replace DOS via a DOS command.

You'll also get some strange results if you try to do the first step (the DOS 3.2 BSAVE) with an EXEC file. Any EXEC command after the memory move will get trapped in the DOS buffer and be transferred with the rest of the DOS BFILE onto the 3.3 disk, where it will attempt to execute at the end of the EXEC function in step 2. How's that for strange??

You can make immediate use of this technique (but not the NIFFUM program per se) by transferring Apple's FID program from your DOS 3.3 System Master Disk to a DOS 3.2 disk. Surprise!! FID works just fine under DOS 3.2. Even the disk space function gives the correct answer. Now you can have all those neat catalog maintenance functions (including automatic transfer of binary files and text files, and the WILDCARD capability) under DOS 3.2 and 3.3. Funny Apple didn't mention that. Helpful hint: Since, FID bloads at $803, BLOAD DOS 3.2 BFILE a little higher in memory (suggest $2000).

Cheers!!

*** NIFFUM ***

```
October 1980 CJ Thompson
0 rem *** THIS IS NIFFUM ***
1 REM WHICH CREATES AN EXEC FILE
2 REM WHICH BLOADS THE DOS 3.2
3 REM FILE AFTER IT HAS BEEN
4 REM MUFFINED FROM THE DOS 3.2
5 REM DISK TO THIS DOS 3.3 DISK
6 REM AFTER LOADING YOUR INTEGER
7 REM BASIC FILE TO BE NIFFUMED
8 REM TO THE DOS 3.2 DISK WHICH
9 REM YOU HAVE WAITING - RIGHT?
10 REM
20 TEXT:  CALL -936
50 DIM NA$(30),FI$(10)
60 FI$="DOS.E"
70 D$="":  REM CTRL-D
80 C$="":  REM CTRL-C
90 PRINT D$;"MON C,I,O"
100 INPUT "NAME OF INTEGER PROGRAM:",NA$
120 TEXT:CALL -936
130 PRINT "*** WHEN ALL THE ACTION STOPS, ENTER"
140 PRINT "A CTRL-C.  THEN SAVE THE PROGRAM"
145 PRINT "TO A DOS 3.2 FORMATTED DISK ***"
147 PRINT "=============================="
148 POKE 34,4:VTAB 6
150 PRINT D$;"OPEN";FI$
160 PRINT D$;"DELETE";FI$
170 PRINT D$;"OPEN  ";FI$
180 PRINT D$;"WRITE ";FI$
200 PRINT "LOAD";NA$
210 PRINT "BLOAD DOS 3.2 BFILE"
220 PRINT "CALL-151"
230 PRINT "9600<800.31FFM"
260 PRINT D$;"CLOSE";FI$
280 PRINT D$;"NOMON C,I,O"
300 PRINT D$;"EXEC";FI$
500 END
```

APPLE III DABBLING

by Rick Smith

Several days ago, a friend of mine called and told me to try something unusual on the Apple III that I had. He asked me to press the "CONTROL" key, the "OPEN APPLE" key and the "RESET" key simultaneously, then release the "RESET" key and in about one second second release the other two keys. Well much to my surprise a small right arrow (→) and a blinking underscore appeared on the screen in front of me. Apparently we had found the Apple III's monitor and my job was to find out what it could do.

After trying several combinations here is what I have come up with.

X.Y
Displays the contents of memory locations X through Y inclusive. The format is eight bytes per line with an address on the left and the ASCII equivalent of each byte on the right. (this is quite similar to the Apple II's monitor.)

Example:

1000*C1 C2 C3 C4 C5 C6 C7 C8 ABCDEFGH

When a long range of memory, greater than one or two screenfuls is being displayed, pressing the space bar will "freeze" the display. Pressing the space bar again, will cause the screen to scroll up one line and next eight bytes will be displayed at the bottom of the screen.

Pressing any key except RETURN will cause the screen to return to its normal fast scroll. Holding the space bar down causes a slow scroll of the memory contents until the end of the specified memory range is reached. Pressing the "RETURN" key while the screen is scrolling or stationary will cause the user to "return" to the monitor prompt.

X:Y
This causes the contents of location X to be changed to Y. Each hexadecimal number typed after Y, with a space between each one, will cause the subsequent bytes to be changed.(This works exactly as in the Apple II monitor described in the Apple Reference Manual on pages 43 and 44.)

RETURN
Each time the "RETURN" key is pressed the next eight bytes are displayed. Since this key is self repeating on the Apple III, holding this key down is another way of causing a slow scroll of memory contents.

X<Y.ZM
This move command works identically to the Apple II command described on page 46.

X,Y.ZV
This verify works the same way as the Apple II's, however when a match is not found this display:

X:Y A:B

is displayed. (Where X and A are the memory locations that "should" have been the same and Y and B are the contents of those locations respectively.

After this, I proceeded to try all the letters in the alphabet to try to find more commands. Apparently, commands which are not understood by the system sound a beep.

A	display the contents of location A
B	Display the contents of location B
C	Display the contents of location C
D	Display the contents of location D
E	Display the contents of location E
F	Display the contents of location F

G
Executes a machine language routine at the last location specified in a command. XG executes a machine language program beginning at location X. (Exactly like Apple II's monitor as described on pages 48 and 49).

H and I- Error (system beeps)

J
Turns disk drive on, sometimes causes underscore prompt to disappear at other times.

K,L,M,N,O,P,Q- all errors (the system beeps for each one)

R
Reads Disk? (the disk starts to spin)
8000 R at one time generated an 82!(I/O error code?)
500R and 600R-filled part of the screen with flashing characters.(Text page area?)
1000R-filled locations 1000-1FFF with what appeared to be the beginning of the disk directory. (this area was cleared with FF's, using the move command described above, prior to the 1000R.)

S and T-errors (system beeps)

U- prompt disappears.

V- error (system beeps)

W- Write to disk? The disk drive starts to spin and a "scratch disk" caused and 82! (error.)

X- Prompt disappears sometimes and the Apple III makes a soft (barely audible) high frequency pitch change. Other times, one or two lines are listed after the current pointer (like X.Y)

The only control characters I noticed that were useful were:
CNTL-X kill currently typed line.
CNTL-H backspace.
Well, that all I've come up with, for now. If anyone finds any new functions or features or can explain some of the unknown functions and syntax, please let me know.

Editors note-this is Harvest's first venture into the Apple III'S internals. If you are one of the few who are using this machine, maybe you will enjoy trying a little detective work to find out the real details of the system. It is this kind of inquiry that brought us many of the details of the Apple II.

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REMOTE CP/M SYSTEM

I am currently testing a remote CP/m system running on my Apple using the Z80 soft card, 56K CP/M system, with four drives, two Apple drives and two 8" Shugarts. I plan to leave it up while I am at work (9-5 weekdays) and invite any and all to try it out. When it answers, give a few <CR>'s and answer the sign-on questions as usual with CBBS. You then find yourself in RBBS, a public domain bulletin board system written in MBASIC and compiled with the BASIC compiler. Messages for me may be left there.

Those who are interested in running CP/M remotely will need to ask me for a password. The reason for this is that I have several languages on my system that allow direct memory access and it would be no problem at all for a mischievous person to blow the system, so I can't leave CP/M open to the general public. Dave Moritz and Calamity Cliff have completely public systems, but of course they protect them by not allowing memory access. Dave's system is on an Apple.

Those having the Z80 card are invited to transfer CP/M users group software from my system to theirs. This can be done remotely. Simply leave a message asking that the desired program be mounted and telling me when you will call back for it. I have all of the CP/MUG software that is runnable by the Apple CP/M.

If you are interested in running remote CP/M yourself, the programs to do so are available and in the public domain. They can also be transferred from my system. The latest versions have also been donated to the library.

The number is 324-6194. This is NOT A dedicated line, so please don't call at night unless you want to talk to me. If you find any bugs, let me know.

Thanks,
Gordon Banks
3/5/81

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